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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/541,032

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Isao Nishimura

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EXAMINER

JOHNSON, CONNIE P

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

05/05/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/541,032

Applicant(s)

NISHIMURA ET AL.

Examiner

CONNIE P. JOHNSON

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1.3.6-10 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1.3.6-10 and 12-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date 2/12/2009
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The remarks and amendment filed 2/13/2009 have been entered and fully considered.
2. Claims 1-3, 6-10 and 12-14 are presented.
3. Claims 1 and 3 are amended.
4. Claims 4-5, 11 and 15-20 are cancelled per applicants' request.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 6-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., U.S. Patent Publication No. 2001/0026901 A1.

Maeda teaches a photoresist composition comprising a polymer and a photoacid generator. The polymer comprises a recurring group as in formula (2) of Maeda on page

2. The recurring group comprises an alicyclic group with a lactone structure. The polymer also comprises a second recurring group attached. Maeda shows the second recurring group as R₄ in formula (2) (page 15, formula (2), wherein R⁴ is an alicyclic hydrocarbon having 7 to 13 carbons atoms with an acid-labile group wherein the acid-labile group is t-butyl (page 15, [claim 3] and page 3, [0031]). The t-butyl group is an alkyl of 1 to 4 carbons as the R² substituent with the alicyclic hydrocarbon in the present

invention. The second recurring unit in Maeda meets the limitations of instant claim 1, formula (1). Maeda teaches the polymer has a ratio of weight average molecular weight to a number average molecular weight of 1.45, 1.4 and 1.5, respectively. The difference between the present application and the prior art is that Maeda does not teach the ratio of weight average molecular weight to a number average molecular weight is 1.0 to 1.3. However, as shown above, the reference does teach 1.4 which is extremely close in range and the result would be expected to be the same, absent any evidence to the contrary.

“A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)” (MPEP 2144.05). Therefore, it would have been obvious to one of ordinary skill in the art that the polymer of Maeda comprising a recurring unit of formula (2) would be expected to have the same properties and perform in the same manner as the presently claimed polymer. The polymer that is used in the photoresist composition is obtained by polymerization with a radical polymerization initiator (page 7, [0040]). The recitation in present claim 1, that the acid-labile group-containing resin is “polymerized with a living radical polymerization initiator,” is a process limitation and does not add positive recitation to the claim. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re

Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (MPEP 2113). Maeda also teaches a triphenylsulfonium salt compound as the photoacid generator in the composition (page 7, [0044]). I think you missed the point of what I was asking you to show

7. Claims 1-3, 6-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohsawa et al., U.S. Patent No. 6,416,928 B1 in view of Nozaki et al., EP 1184723 A2.

Ohsawa teaches a chemically amplified resist composition comprising a polymer resin with an acid-labile group and a photoacid generator. The polymer becomes alkali soluble by the action of an acid. In column 16, formula (2a') shows a recurring unit wherein group OR^{6a} is an acid-labile group. Substituent OR^{6a} may comprise an alicyclic group as in substituent formula (7) in column 17. When formula (7) is used, two of the R² groups in formula (1) of claim 1 form an alicyclic group. The polydispersity of the recurring units with an acid-labile group is preferably less than 1.5 (col. 15, lines 48-49). Ohsawa also teaches that the acid-labile recurring unit is present in an amount of up to 50mol% (col. 16, line 3-16). The recitation in present claim 1, that the acid-labile group-containing resin is "polymerized with a living radical polymerization initiator," is a process limitation and does not add positive recitation to the claim. In addition, the limitation wherein the acid-labile group containing resin is produced by random polymerization is a process limitation and has no patentable weight. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not

depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted) (MPEP 2113). The photoacid generators comprise a (4-tert-butylphenyl)diphenylsulfonium salt (col. 10, 57-58). Ohsawa also teaches a basic component to suppress the rate of diffusion when the acid generated by the photoacid generator diffuses within the resist film (col. 42, lines 30-35). Ohsawa does not teach that the recurring units in the polymer comprise formula (2) of claim 1.

However, Nozaki teaches a resist composition comprising a photoacid generator and a film forming polymer with an alkali-soluble group (page 7, [0031-0032]). The polymer preferably has a norbornyl alicyclic group in the recurring unit (page 7, [0033]). The norbornyl alicyclic group controls alkali-solubility in the resist composition (page 8, [0035-0036]). Example 23 of Nozaki teaches formula (2) of claim 2 as a recurring unit of the polymer. Nozaki also teaches that the norbornyl alicyclic group is present in an amount of 5 to 95mol% (page 8, [0037]). It would have been obvious to one of ordinary skill in the art to use the norbornyl alicyclic group of example 23 in Nozaki in the composition of Ohsawa to maintain alkali-solubility in the resist composition as required by Ohsawa (Ohsawa, col. 4, lines 8-17).

Response to Arguments

8. Applicant's arguments, filed 2/13/2009 with respect to the rejection(s) of claim(s) 1-3, 6-9 and 12-14 under 103(a) and claims 1-14 under 103(a) have been fully

considered and are persuasive. Therefore, the rejections have been withdrawn.

However, upon further consideration, new ground(s) of rejection are made herein.

9. Applicant argues that the resin is a random copolymer.

That the resin is a random copolymer does not add positive recitation to the claims because claim 1 recites, “wherein the resin is polymerized with a living radical polymerization initiator such that the resin is a random copolymer of the recurring units...” The recitation is process language because the random copolymer is formed by the living radical polymerization process. The resin composition comprises a free-radical initiator. Therefore, the monomer units are capable of forming a random copolymer.

10. Applicant argues that Ohsawa does not teach that the resin is a random copolymer. Further, applicant argues that Ohsawa teaches the polymer has a low polydispersity synthesized by living anionic polymerization, which would not produce a random copolymer.

The limitation in claim 1, that the acid-labile group-containing resin is “polymerized with a living radical polymerization initiator,” is a process limitation and does not add positive recitation to the claim. The composition comprises a free-radical initiator. Therefore, the monomer units are capable of forming a random copolymer. Further, that the resin is a random copolymer does not add positive recitation to the claims because claim 1 recites, “wherein the resin is polymerized with a living radical polymerization initiator such that the resin is a random copolymer of the recurring units...” The recitation is process language because the random copolymer is formed by the living radical polymerization process.

11. Applicant argues that even for simple copolymer mixtures, well defined random copolymers cannot be prepared using anionic procedures, including living anionic polymerization. Further, that Ohsawa would teach away from the composition of claim 1.
12. Ohsawa does not teach away from the present claims. The limitation in claim 1, that the acid-labile group-containing resin is “polymerized with a living radical polymerization initiator,” is a process limitation and does not add positive recitation to the claim. The composition comprises a free-radical initiator. Therefore, the monomer units are capable of forming a random copolymer.
13. Applicant argues that the use of random living anionic copolymerization would not produce a random copolymer as set forth in claim 1. Further, applicant cites Matyjaszewski et al. as evidence that random copolymers cannot be produced by using anionic procedures, including living anionic polymerization.

Although applicant cites Matyjaszewski et al. as showing the definition of a random copolymer, living radical polymerization is a process and the process of living radical polymerization does not add patentable weight to the claims. Maeda teaches the same recurring units as claimed. In addition, Maeda teaches a radical polymerization initiator in the composition. Therefore, the composition of Maeda is capable of forming a random copolymer.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CONNIE P. JOHNSON whose telephone number is (571)272-7758. The examiner can normally be reached on 7:30am-4:00pm Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Connie P. Johnson/
Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795